GL-TR-90-0288
SPECIAL REPORTS, NO. 264

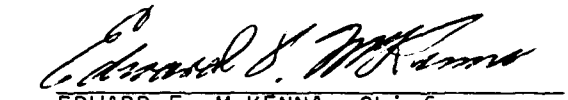
Sounding Rocket Flight Data Summary, 1977–October 1990

EDWARD F. McKENNA

26 October 1990

AEROSPACE ENGINEERING DIVISION PROJECT 7659
GEOPHYSICS LABORATORY
HANSCOM AFB, MA 01731-5000

"This technical report has been reviewed and is approved for publication"



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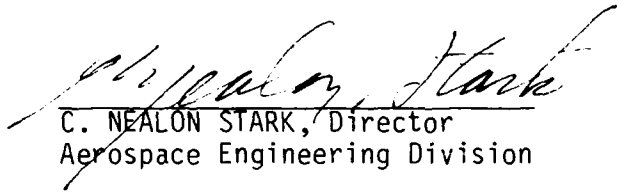

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	26 October 1990	Scientific Interim 1977-Oct. 1990

4. TITLE AND SUBTITLE
Sounding Rocket Flight Data Summary,
1977 - October 1990

5. FUNDING NUMBERS
PE 62101F
PR 7659 TAOY WU

6. AUTHOR(S)
Edward McKenna

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Geophysics Laboratory (LCI)
Hanscom AFB
Massachusetts 01731-5000

8. PERFORMING ORGANIZATION REPORT NUMBER
GL-TR-90-0288
SR, No. 264

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This report is a summary listing of all GL sounding rockets launched from 1977 to October 1990. Listed data includes launch date, rocket type, launch location, principal scientist, payload weight, payload diameter, apogee information, system performance and experiment description.

14. SUBJECT TERMS
Sounding Rockets
Launch Summary
System Performance

15. NUMBER OF PAGES
28

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAR

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Sounding Rocket Flight Data Summary 1977-October 1990

1. INTRODUCTION

The sounding rocket has become the standard workhorse for carrying scientific experiments to the upper atmosphere and beyond for exploration and investigation.

Our first sounding rocket was a German V-2, launched from the White Sands Missile Range on 22 August 1946. Over 40 years have passed and the need for sounding rockets still continues.

This report is a summary of the sounding rockets flown by the Air Force Geophysics Laboratory from 1977 through October 1990. As of 15 March 1989, AFGL was redesignated Geophysics Laboratory (GL).

Those flown before this period are listed in *Summary of AFCRL Rocket and Satellite Experiments (1946-1966)*, McIntyre A., December 1966, AFCRL-66-868, AD649333, Special Reports, No. 54, and in the *Sounding Rocket Flight Data Summary (1966-1976)*, C. Nealon Stark and Capt. Alan K. Williams USAF, 15 May 1978, AFGL-TR-78-0120, ADA059005, Special Reports, No. 213..

Explanation of Vehicle and Launch Site Codes are on p. 23.

(Received for Publication 26 October 1990.)

SOUNDING ROCKET FLIGHT DATA SUMMARY

1977				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A11.712-1	05/18	DENSITY	208	188		S	10 Inch Falling Sphere	S	100%
	Nike-Hydac	KMR	Faire	12			S			
2	A03.509-1	08/09	SOLAR UV	304	168	S	S	UV Spectrometer	S	100%
	Aerobee 150	WSMR	Bedo	15	219	S	S			
3	A07.707-1	09/24	DMSP CHEM.	128	178		S	Chemical Release	S	100%
	Nike-Iroquois	WSMR	Vickery	7.8	205					
4	A10.705-1	09/24	DMSP MS SP	284	199	S	S	Neutral Composition	S	100%
	Paiute-Tomahawk	WSMR	Philbrick	12	223	S	S			
5	A24.609-1	11/11	TEM-1	3200	228	F	S	UV/IR Target Engine Meas.	P	50%
	ARIES	WSMR	McIntyre	38	262	P	S			
6	IC730.09-1	11/13	FWIFI	740	141	S	S	Field Widened Interferometer	F	F
	Sergeant	PFRR	Ulwick	17.3	193	S	S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1977				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
7	A04.602	12/13	PRECEDE	683	102		S	30 kW Electron Gun	S	100%
	Aerobee 170	WSMR	O'Neil	12	172	S	S			

S - Success
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SOUNDING ROCKET FLIGHT DATA SUMMARY

1978				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A31.603	01/21	CHARGING	378	257		S	Vehicle Charging	S	100%
	Astrobee-F	WSMR	Cohen	15	265	S	S			
2	IC819.08-1	02/28	MULTI	410	458	S	S	IR Instruments	S	100%
	Sergeant-Hydac	PFRR	Ulwick	17.3	350		S			
3	A11.712-3	04/05	DENSITY	210	26		F	10 Inch Falling Sphere		F
	Nike-Hydac	KMR	Philbrick	12						
4	A11.712-4	04/05	DENSITY	210	174		S	10 Inch Falling Sphere	P	50%
	Nike-Hydac	KMR	Philbrick	12			S			
5	A04.606-1	05/16	EUV	415	191	S	S	UV Spectrom Photometer	F	F
	Aerobee 170	WSMR	Heroux	15	230	S	P			
6	A45.710-1	05/20	SMOKE	548	53		S	Chemical Release	S	100%
	Nike-Nike	WFF	Quesada	17	120					

S - Success
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SOUNDING ROCKET FLIGHT DATA SUMMARY

1978				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
7	A45.710-2	05/22	SMOKE	549	54		S	Chemical Release	S	100%
	Nike-Nike	WFF	Quesada	17	120					
8	A03.604	07/25	DENSITY	376	144		S	Laser Density	P	50%
	Aerobee 150	WSMR	Bedo	15	205	S	P			
9	A45.709-1	09/13	SMOKE	668	45		S	Chemical Release	S	100%
	Nike-Nike	CRR	Quesada	17	110					
10	A45.709-2	09/13	SMOKE	650	45		S	Smoke	S	100%
	Nike-Nike	CRR	Quesada	17	110					
11	A08.708-1	09/15	CLUSTER ION	464	114	S	S	Positive/Negative MS SP	S	75%
	Nike-Tomahawk	WSMR	Narcisi	12	170	F	P			
12	A04.711-1	09/19	SOLAR UV	400	192	S	S	Spectrometer Photometer	S	100%
	Aerobee 170	WSMR	Bedo	15	231	S	S			

S - Success
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SOUNDING ROCKET FLIGHT DATA SUMMARY

1978				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
13	IC807.15-1	10/26	DYNAMICS	310	122		S	Auroral Dynamics	S	90%
	Nike-Hydac	PFRR	Ulwick	12	177	F	S			
14	IC806.35-1	10/26	DYNAMICS	136			F	Chemical Release	F	F
	Nike-Javelin	PFRR	Vickery	9						
15	IR807.57-1	10/26	ENERGY	270	160		S	IR Aurora	S	100%
	Nike-Hydac	PFRR	Ulwick	12	198	F	S			
16	EX851.44-1	10/29	EXCEDE I	4470	137	S	S	Electron Guns	F	F
	Talos-Castor	PFRR	O'Neil	32	196	P	F			
17	IC830.09-1	11/13	FWIF II	745	141	S	S	Auroral IR Spectra	F	F
	Sergeant	PFRR	Ulwick	17.3	190	S	S			

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SOUNDING ROCKET FLIGHT DATA SUMMARY

1979				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A24.7S1-1	01/20	SPICE I	1832	249	F	S	IR Background		F
	ARIES	WSMR	Price	38	340		S			
2	A12.9A1-1	02/26	ECLIPSE DEN	214	160		S	10" Falling Sphere	S	100%
	Nike-Orion	Red Lake	Philbrick	12			S			
3	A12.9A2	02/26	ECLIPSE LWIR	272	141		S	IR Radiometer	S	100%
	Nike-Orion	Red Lake	Ulwick	12	189		S			
4	A10.802-1	02/26	ECLIPSE MS	433	115	S	S	Mass Spect. Gerdiens	S	90%
	Paiute-Tomahawk	Red Lake	Narcisi	12	173	S	S			
5	A10.802-2	02/26	ECLIPSE MS	433	117	S	S	Mass Spect. Gerdiens	S	90%
	Paiute-Tomahawk	Red Lake	Narcisi	12	173	P	S			
6	A07.712-2	02/26	ECLIPSE DEN	128	215		S	7" Falling Sphere	S	100%
	Nike Iroquois	Red Lake	Faire	7.8			S			

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SOUNDING ROCKET FLIGHT DATA SUMMARY

1979				Payload	Apogee	Results				
Line No.	GL No. Type	Date Location	PROJECT Scientist	Wt. (lb) Dia. (in.)	Alt. (km) Time (sec)	ACS Recovery	Vehicle Support	Experiments	Exper. Remarks	Overall Performance
7	A31.702	08/03	FWR III	750	172		S	Field Widened Interferometer	S	90%
	Astrobee F	WSMR	Wheeler	17.3	217	S	S			
8	A18.805	08/07	POST B.O.	650	219	S	S	Post Burnout Thrust Meas.	S	90%
	Blk. Brant VC	WSMR	McKenna	17.3	235	S	S			
9	A08.705-2	08/14	DMSP MS	284	190	S	S	Neutral Mass Spectrometer	P	50%
	Nike-Tomahawk	WSMR	Philbrick	12	218	S	S			
10	A08.706-2	08/14	DMSP DENS	282	18		F	10 Inch Density Sphere		F
	Nike-Tomahawk	WSMR	Philbrick	12						
11	A04.703	08/14	DMSP UV	735	111	S	S	UV Spectrometer Photometer	P	50%
	Aerobee 170	WSMR	Heroux	15	222	S	P			
12	A51.970	10/18	EXCEDE II	5690	128	S	S	120 kW Electron Gun	P	50%
	Talos-Castor	PFRR	O'Neil	32	184	F	S			

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SOUNDING ROCKET FLIGHT DATA SUMMARY

1979				Payload	Apogee	Results				
Line No.	GL No. Type	Date Location	PROJECT Scientist	Wt. (lb) Dia. (in.)	Alt. (km) Time (sec)	ACS Recovery	Vehicle Support	Experiments	Exper. Remarks	Overall Performance
13	A45.803-1 Nike-Nike	10/23 Peru	SMOKE Quesada	550 17	50		S	Chemical Release	S	100%
14	A45.803-2 Nike-Nike	10/24 Peru	SMOKE Quesada	550 17	50		S	Chemical Release	S	100%
15	A45.803-3 Nike-Nike	10/29 Peru	SMOKE Quesada	550 17	50		S	Chemical Release	S	100%

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SOUNDING ROCKET FLIGHT DATA SUMMARY

1980				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A24.609-2	05/21	TEM-2	2997	230	S	S	IR/UV Target Engine Measurements	S	100%
	ARIES	WSMR	McIntyre	38		S	S			
2	A24.6S1-1	08/18	ZIP-I	1246	401	S	S	IR Zodical	S	100%
	ARIES	WSMR	Murdock	20.8		S	S			
3	A04.801	09/18	UV	376	197	S	S	Solar Max UV	S	100%
	Aerobee 170	WSMR	Bedo	15		S	S			
4	A10.901-1	10/22	SPE-I	515	88	S	S	Mass Spect. Solar Protons	S	100%
	Paiute-Tomahawk	PFRR	Narcisi	12		S	S			
5	A14.021-1	10/22	SPE-IA	10	88		S	Charged Particles	S	100%
	Super-Arcas	PFRR	Narcisi	4.5			S			
6	A13.073	11/16	ENERGY B	310	195		S	IR Heating	S	100%
	Taurus-Orion	ARR	Stair	12			S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1981				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A24.7S1-1	02/03	IRBS	1782	389		S	Earth limb IR Background	F	F
	ARIES	WSMR	Murdock	38			Failure			
2	A30.072	02/05	FWIF IV	790	130	S	S	Field Widened Interferometer	Failure	F
	Sergeant	PFRR	Wheeler	17.3		S	S			
3	A13.030	03/07	AURORAL EI	437	150	S	S	UV Aurora	S	100%
	Taurus-Orion	PFRR	McMahon Vantassel	14			S			
4	A13.031	03/07	AURORAL E2	376	164	S	S	UV Aurora	S	100%
	Taurus-Orion	PFRR	McMahon Paulson	14			S			
5	A13.020	03/07	AURORAL E3	324	188		S	Mass Spectrometer	S	100%
	Taurus-Orion	PFRR	Narcisi	12			S			
6	A10.903	03/07	AURORAL E4	270	175		S	10" Sphere/ E-Field/Chemical	S	100%
	Paiute-Tomahawk	PFRR	Many	12			S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1981				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
7	A24.6S1-2	07/31	ZIP II	1260	395	S	S	IR Zodical	S	100%
	ARIES	WSMR	Murdock	20.8		S	S			
8	A10.901-2	10/26	SPE-2	501	96	S	S	Mass Spec Solar Proton	S	100%
	Paiute-Tomahawk	PFRR	Narcisi	12		S	S			
9	A30.175	11/07	FWIF V	790	138	S	S	Field Widened Interferometer	Failure	F
	Sergeant	PFRR	Wheeler	17.3		S	S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1982				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A24.7S2-2	01/23	FIRSSE	1484	378	S	S	FAR IR	S	100%
	ARIES	WSMR	Price	38	332	S	S			
2	A24.609-3	05/28	TEM-3	3100	236	S	S	IR/UV Target Engine Measurements	S	80%
	ARIES	WSMR	McIntyre	38	260	S	S			
3	A13.277	06/29	TRACER	402	150		S	Truth Rocket	S	100%
	Taurus-Orion	WFF	Picard	12	198		S			
4	A19.124-1	09/08	BIME	460	323		S	Ionospheric Modification	S	100%
	Blk. Brant VIII	NRR	Narcisi	17.3			S			
5	A20.123-1	09/08	BIME	175	524		S	Ionospheric Irregularities	S	100%
	Sonda III	NRR	Narcisi	11.8	384		S			
6	A20.123-2	09/13	BIME	174	549		S	Ionospheric Irregularities	Partial	50%
	Sonda III	NRR	Narcisi	11.8	388		S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1982				Payload	Apogee	Results				
Line No.	GL No. Type	Date Location	PROJECT Scientist	Wt. (lb) Dia. (in.)	Alt. (km) Time (sec)	ACS Recovery	Vehicle Support	Experiments	Exper. Remarks	Overall Performance
7	A19.124-2	09/13	BIME	465	334		S	Ionospheric Modification	S	100%
	Blk. Brant VIII	NRR	Narcisi	17.3			S			
8	A24.7S2-3	09/15	SPICE 2	1494	359	S	S	IR Celestial Background	S	100%
	ARIES	WSMR	Price	38	324	S	S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1983				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A31.200	03/01	SES	640	197	S	S	Sensor Ejection System	S	100%
	Astrobee F	WSMR	McKenna	17.3		S	S			
2	A51.971	03/18	ELIAS	1492	305	S	S	Earth Limb IR Aurora	S	80%
	Talos-Castor	PFRR	Nadile	32	280	F	S			
3	A30.276	04/12	FWIF VI	903	140	S	S	Field Widened Interferometer	S	100%
	Sergeant	PFRR	Cook	17.3	185	S	S			
4	A04.902	04/19	UV	345	204	S	S	UV Spectrometer/ Photometer	S	100%
	Aerobee 170	WSMR	Heroux	15	237	S	S			
5	A14.311-1	06/14	STATE	9	101		S	DC Electron Probe	S	100%
	Super-Arcas	PFRR	Philbrick	4.5			S			
6	A11.074	06/15	STATE	336	134		S	10 inch Sphere/ Photometer, etc.	S	100%
	Nike-Hydac	PFRR	Philbrick	9	184		S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1983				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
7	A14.311-2	06/15	STATE	9	106		S	DC Electron Probe	S	100%
	Super-Arcas	PFRR	Philbrick	4.5			S			
8	A14.311-3	06/17	STATE	9	98		S	DC Electron Probe	S	100%
	Super-Arcas	PFRR	Philbrick	4.5			S			
9	A24.260	10/24	ELC-I	1315	283	S	S	IR Earth Limb Clutter	S	100%
	ARIES	WSMR	Murdock	20.8	291	S	S			
10	A20.327-1	10/31	IMS	311	81		F	Mass Spec/ E-Field, etc.	F	F
	Sonda III	WFF	Weber	11.8						
11	A08.708-2	11/09	IMS	125	348		S	Chemical Release	S	100%
	Nike-Tomahawk	WFF	Vickery	9			S			
12	A20.327-2	11/14	IMS	311	55		F	Mass Spec/ E-Field	F	F
	Sonda III	WFF	Weber	11.8						

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1985				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A21.426	03/15	PIIE	460	429	S	S	Mass Spec/ E-Field	S	100%
	Black Brant IX	GRN	Weber	12			S			
2	A19.250	06/14	BERT	880	243		S	Beam Emission/ Charging	S	90%
	Black Brant VIII	WSMR	Cohen	17.3	254		S			
3	A44.362	06/17	BEAM	544			F	Equatorial IR Astronomy	F	F
	Castor-Lance	NRR	Price	15						
4	A40.401	11/19	HARP	968	667		S	High Altitude Recovery Dev.	S	95%
	Sonda IV	NRR	McKenna	22	463	S	S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1986				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A51.378	04/08	SPIRIT I	2623	241	S	S	Earth Limb IR Interferometer	S	95%
	Talos-Castor	PFRR	Smith	36	253	S	S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1987				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A21.628	02/26	POLAR ARC	552	387	S	S	Mass Spec/ E-Field	S	98%
	Black Brant IX	GRN	Weber	12	319		S			
2	A19.427	03/21	POLAR ARC	503	354		S	Chemical Release Disc Probes	S	100%
	Black Brant VIII	GRN	Weber	17.3	310		S			
3	A12.629	08/14	COLDR	508	86		S	Sub-Sonic Mass Spec	S	100%
	Nike-Orion	WFF	Ballenthin	12	147	S	S			
4	A22.703	12/13	SPEAR I	823	367	S	S	High Voltage Discharge	S	95%
	Black Brant X	WFF	Raike	17.3			S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1988				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. / Remarks	Overall / Performance
1	N36.015	02/08	ECHO-7	835	292		S	Electron Gun	S	100%
	Black Brant IX	PFRR	Malcom	17.3			S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1989				Payload	Apogee	Results				
Line No.	GL No. Type	Date Location	PROJECT Scientist	Wt. (lb) Dia. (in.)	Alt. (km) Time (sec)	ACS Recovery	Vehicle Support	Experiments	Exper. Remarks	Overall Performance
1	A24.602	07/13	BEAR	3676	195	S	S	Neutral Particle Beam	S	100%
	ARIES	WSMR	McKenna	44	244	S	S			

S - Success
P - Partial Success
F - Failure

SOUNDING ROCKET FLIGHT DATA SUMMARY

1990				Payload	Apogee	Results				
Line No.	GL No. / Type	Date / Location	PROJECT / Scientist	Wt. (lb) / Dia. (in.)	Alt. (km) / Time (sec)	ACS / Recovery	Vehicle / Support	Experiments	Exper. Remarks	Overall Performance
1	A26.804	01/30	TM2-I (HPB)	2582	422	S	S	Vehicle Test	S	100%
	Talos-M56A1	WFF	McKenna	44	346		S			
2	A24.570	04/27	EXCEDE III	5570	115	S	S	Electron Deposition	S	100%
	ARIES	WSMR	Paulson	38	194	S	S			

S - Success
P - Partial Success
F - Failure

GL VEHICLE CODES

The number code consists of the following: The letter "A", two digits, a decimal, three digits.

A identifies a GL rocket.

The two digits before the decimal identify the vehicle flown.

The first digit after the decimal identifies the fiscal year the rocket was approved.

The next two digits represent the using GL science branch.

Vehicle numbers starting with an "N" were GL payloads on NASA rockets. Vehicle numbers starting with IC, IR or EX were DNA sponsored rockets.

GL VEHICLE CODE

02. Mighty Mouse
03. Aerobee 150
04. Aerobee 170
07. Nike-Iroquois
08. Nike-Tomahawk
10. Paiute-Tomahawk
11. Nike-Hydac
12. Nike-Orion
13. Taurus-Orion
14. Super Arcas
18. Black Brant VC
19. Black Brant VIII

GL VEHICLE CODE

20. Sonda III
21. Black Brant IX
22. Black Brant X
24. Aries
25. Minuteman I
26. TM2 (Talso-M56A1)
30. Sergeant
31. Astrobee F
40. Sonda IVstor
44. Castor-Lance
45. Nike-Nike
51. Talos-Castor

GL BRANCH CODE

01-09 LCI
10-19 OPA
20-29 LID
40-49 LIS

GL BRANCH CODE

50-59 PHG
60-69 OPI
70-79 OPB
80-89 LYA

GL LAUNCH SITE CODE

ARR - Andoya Rocket Range, Norway
CRR - Churchill Research Range, Manitoba, Canada
GRN - Sondestrom, Greenland
KMR - Kwajelin Missile Range, Marshall Islands
NRR - Barreira Do Inferno, Natal, Brazil
PFRR - Poker Flat Research Range, AK
Red Lake - Red Lake, Ontario, Canada
WFF - NASA/GSFC Wallops Flight Facility, VA
WSMR - White Sands Missile Range, NM